

## **REMARKS**

Allowable claim 21 has been rewritten in an independent form and is a combination of original claim 20 and claim 21. Dependent claims 22-27 are likewise allowable.

Claims 28 and 32: Applicants respectfully believe that the Examiner has not quite understood what is disclosed in respect of the detection method of U.S. Patent No. 5,451,772. The light source taught by Narendran is a monochromatic one of a pre-selected frequency, in contrast to that in the present invention which is a broadband light source and has an output over a wavelength range. The detection mechanism (col. 3, lines 15-27 of Narendran) is entirely different from that used in the present invention, also. Narendran teaches a system where (as shown in Fig. 4) as the fiber and etalons are stretched, the optical response of each etalon is a periodically repeating pattern. In order to determine the strain, it is necessary to detect and record the number of cycles exhibited by this phase shift over a given time period and is directly proportional to the rise in strain experienced by the fiber and cavity. Thus, the detector of Narendran detects the number of cycles.

In contrast, the present invention uses reflecting structures, the frequency responses of which change when they are placed under strain (the wavelength of the reflection increases linearly with extension) and thus produce a single or double frequency peak each. The detector of the present invention detects the movement of the frequency of the single or the double peak. This method is suitable for use in static or slow moving systems, as the grating period is fixed, as well as dynamic ones, again because the grating period of each section of the sensor is known.

Fig. 9 of Narendran does not show the frequency of the light detected (as suggested by the examiner at paragraph 2 of the Office Action). What Fig. 9 discloses is a Fourier Transform (col. 4, lines 24-30) of the signal of Fig. 8, in order to determine the two separate periodic responses

that are contained in that signal. Thus, Fig. 9 discloses the combined characteristics of the two separate etalons, both being strained. The reason for the light intensity of the two peaks being different is that the reflecting surface of one of the cavities has been coated to be more reflective than the surfaces of the other cavity.

To highlight the novelty of the present invention further, applicants point out that the device of Narendran can only be used in a dynamic system, (col. 3, lines 57–58), detecting the strain as it is increased. In contrast, the device of the present invention, which detects the frequency change in the reflecting structures, can operate in static situations, making it suitable for use in very slowly varying environments.

It would not be obvious to take the teachings of Narendran, a system which is designed solely for detecting movement in a dynamic system, to make a sensor which can be used in a static system. The monochromatic source of Narendran could not be used in the present system, and the detector of the present system is designed to detect the *shift* in the characteristic wavelength assigned to each grating, not to count the number of cycles that the peak response of Narendran goes through.

Hence, independent claims 28 and 32 and their dependent claims 29-31 and 33-38 are allowable.

New independent claim 39 is a combination of original claim 20 and the detecting means of claim 28, and is patentably distinguished over the art for the reasons advanced above in support of claim 28. New dependent claims 40-42 correspond to claims 33-35.

Submitted herewith is a check for \$120.00 representing the fee for two extra dependent claims in excess of twenty and the excess one independent claim in excess of three.

Petition is hereby made for a two-month extension of the period to respond to the outstanding Official Action to August 7, 2003. A check in the amount of \$410.00, as the Petition fee, is enclosed herewith. If there are any additional charges, or any overpayment, in connection with the filing of the amendment, the Commissioner is hereby authorized to charge any such deficiency, or credit any such overpayment, to Deposit Account No. 11-1145.

Wherefore, a favorable action is earnestly solicited.

Respectfully submitted,

KIRSCHSTEIN, OTTINGER, ISRAEL & SCHIFFMILLER, P.C.

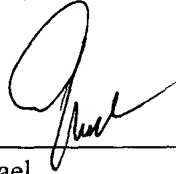
Attorneys for Applicant(s)

489 Fifth Avenue

New York, New York 10017-6105

Tel: (212) 697-3750

Fax: (212) 949-1690



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Alan Israel

Reg. No. 27,564